Supplemental Map Information (User Report)
Outline

Project ID: R02Y11P06

Project Title or Area: Nav_Nation_Wetlands Addon
This project consisted of add on data of a river system to fully map the river that was outside of the original project area R02Y10P04.

Source Imagery (type, scale and date):
The original base digital imagery was obtained from the Navajo Department of Transportation and was flown in 2005. It is 1 m resolution and both true-color and color-infrared are available. Primarily, the color-infrared imagery was used because wetland areas show up as a distinct red color compared to the adjacent desert vegetation communities. Major river systems were updated by adding the USFWS Riparian Classification System (USFWS, 2009), using NAIP imagery from 2006 (Utah), 2007 (Arizona), and 2009 (New Mexico).

Collateral Data (include any digital data used as collateral):
USGS National Hydrologic Dataset (NHD), USGS Digital Raster Graphs (DRG).

Inventory Method (original mapping, map update, techniques used):
The mapping effort was conducted by Ecosphere Environment Services, using "Heads up" digitizing to delineate the wetlands. This method uses aerial digital imagery on the computer monitor and wetlands are delineated on the screen using ESRI ArcGIS software.

Classification (Cowardin wetlands, riparian, uplands, hydrogeomorphic, etc.):

<u>Wetland Definition and Classification</u>

The Service uses the Cowardin *et al.* (1979) definition of a wetland; **Classification of Wetlands and Deepwater Habitats of the United States** (FWS/OBS – 79/31 December 1979). This definition is the Federal standard for classifying and mapping wetlands as determined by the Federal Geographic Data Committee. It is a two-part definition as indicated below:

> *Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water.*
>
> *For purposes of this classification wetlands must have one or more of the following three attributes: 1) at least periodically, the land supports predominantly hydrophytes; 2) the substrate is predominantly undrained hydric soil; and 3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year.*

<u>Riparian Definition and Classification</u>

The term *"riparian"* may be viewed from different perspectives, and has many definitions. In 1997, the western Regions of the Service developed a classification system to identify riparian areas that fell outside of the Cowardin *et al.* (1979) system. Since that time, **"A System for Mapping Riparian Areas in the Western United States"** (USFWS 2009) has also been adopted by the Service and is a national standard for riparian mapping, monitoring and data reporting as determined by the Federal Geographic Data Committee. The definition is indicated below:

> *Riparian areas are plant communities contiguous to and affected by surface and subsurface hydrologic features of perennial or intermittent lotic and lentic water bodies (rivers, streams, lakes, or drainage ways). Riparian areas have one or both of the following characteristics: 1) distinctly different vegetative species than adjacent areas, and 2) species similar to adjacent areas but exhibiting more vigorous or robust growth forms. Riparian areas are usually transitional between wetland and upland.*

This definition and the accompanying classification system were used to identify and map riparian habitats in the study area.

Links to on-line Classification system information:

http://www.fws.gov/Wetlands/_documents/gNSDI/ClassificationWetlandsDeepwaterHabitatsUS.pdf

http://www.fws.gov/Wetlands/_documents/gOther/SystemMappingRiparianAreasWesternUS2009.pdf

Data Limitations:
National Wetlands Inventory digital data were derived from stereoscopic analysis of high altitude aerial photographs. Wetlands and riparian areas were identified based on vegetation, visible hydrology and geography in accordance with **Classification of Wetlands and Deepwater Habitats of the United States** (FWS/OBS – 79/31 December 1979) and **A System for Mapping Riparian Areas in the Western United States** (FWS 2009). There is a margin of error inherent in the use of aerial photos. Age, scale and emulsion of the aerial photos, as well as seasonal and climatic variations at the time of aerial photo acquisition may affect the way in which wetlands and riparian areas are identified.

General Description of the Project Area:
The Navajo Nation is the largest Indian tribe with a land-base of 13.6 million acres that occupies an arid environment in the Four Corners region (AZ, UT, NM, CO) of the southwest U.S. With little precipitation and high evapotransportation rates, development of perennial streams and standing bodies of water within the Navajo Nation is restricted. The San Juan River runs through the Navajo Nation in northwestern New Mexico and southeastern Utah until it flows into Lake Powell. The San Juan River is the primary perennial water source within the Navajo Nation. The Little Colorado River flows through the southern portion of the Navajo Nation in Arizona and is an intermittent stream with flowing water during spring and early summer from snowmelt. The remainder of the Nation primarily supports ephemeral streambeds with some large drainages such as Chinle Brimhall, and Chaco Washes.

Natural history or important cultural features: Semi-autonomous governed Native American territory formed in the late 1800's. Many historic and sacred sites located throughout the work area, including trading posts, monuments, parks, and unique natural features and formations.

Description of Wetland Habitats:
Wetland vegetation communities are restricted to areas where water is available the majority of the growing season. Within the Navajo Nation, this includes the San Juan and Little Colorado Rivers, the banks of Lake Powell, the crest of the Chuska Mountains, and the bottom of ephemeral and intermittent washes. Tamarisk (*Tamarix ramosissima*) shrublands are the most common riparian vegetation community and are found at the base of ephemeral washes where the shrubs sink roots into the groundwater table. Tamarisk shrublands are also common along the banks of the San Juan and Little Colorado Rivers. Along the San Juan River, tamarisk intermix with Russian olive (*Elaeagnus angustifolia*) and cottonwood (*Populus* sp.) trees. Coyote willow (*Salix exigua*) stands are found interspersed with the tamarisk, but mostly have been displaced by the tamarisk.

Emergent wetlands are rare due to the lack of standing water, but are found along the edges of stock ponds, in backwater sloughs along the San Juan River, and along the crest of the Chuska Mountains. These wetlands are dominated by rushes (*Juncus* spp.) and sedges (*Carex* spp.) with cover of cattails (*Typha* sp.) and hardstem bulrush (*Scirpus acutus*). The emergent wetlands found in the Chuska Mountains are unique and have a high diversity of plant species. These wetlands are dependent on seasonal snowmelt and the summer monsoons

- **Organize by Cowardin classification type:** A variety of riverine, palustrine and lacustrine wetland systems were identified. See digital data for all examples.

- **Wetland classification codes and corresponding (general) community type(s):**

Lacustrine Features			
L1UB (H)	Lacustrine, limnetic, unconsolidated bottom	Lakes, reservoirs deeper than 6 meters	none
L2UB (F)	Lacustrine, littoral, unconsolidated bottom	Lakes, reservoirs less than 6 m. deep	none
L2US (C, A, J)	Lacustrine, littoral, unconsolidated shore	Shallow lakes, reservoirs, shore, flats	none
Riverine Features			
R2UB (F, H)	Riverine, lower perennial, unconsolidated bottom	River	none
R2US (C, A, J)*	Riverine, lower perennial, unconsolidated shore	Sand bar	none
R3UB (F, H)	Riverine, upper perennial, unconsolidated bottom	River	none
R3US (C, A, J)*	Riverine, upper perennial, unconsolidated shore	Sand bar	none
R4SB (C, A, J)*	Riverine, intermittent, Streambed	stream	none

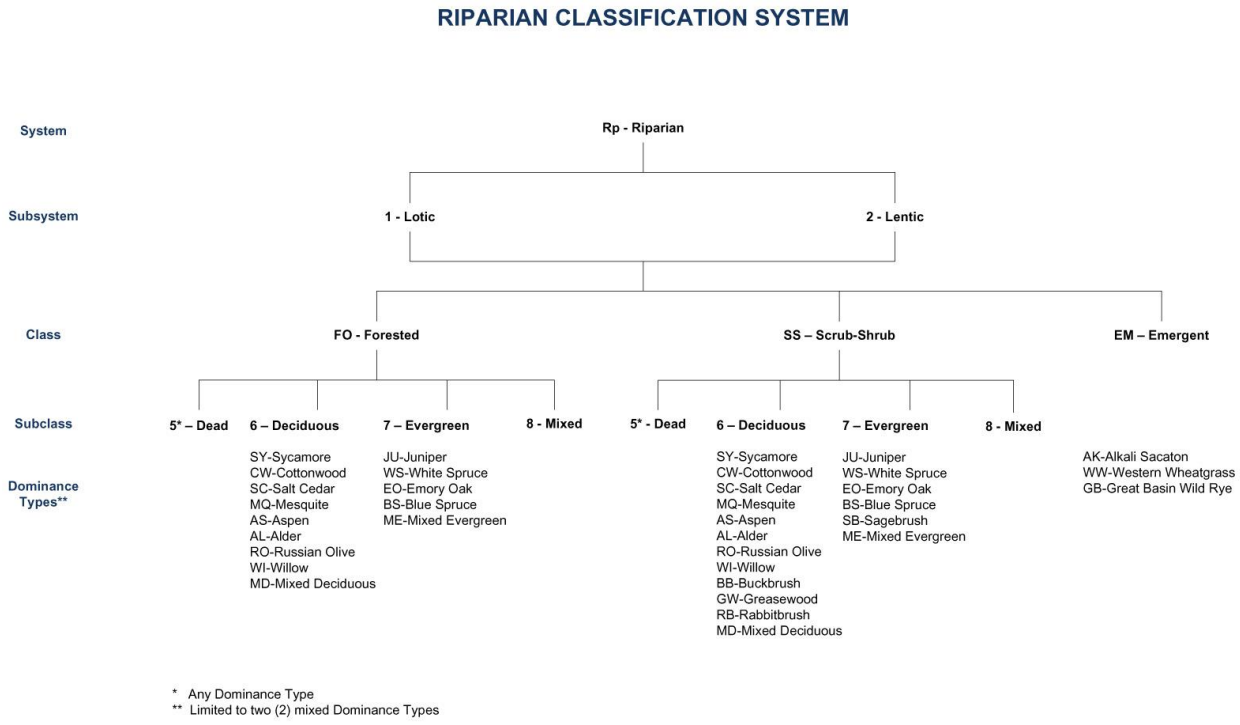
*Subclasses indicating sparse vegetation (US5/SB7) were used for this project.

Palustrine Features

PUB (H, F)	Palustrine, unconsolidated bottom	Ponds, basins	none
PUS (C, A)	Palustrine, unconsolidated shore	Flats, shallow basins, shore	none
PEM1 (F, C, B, A, J)	Palustrine, emergent	Marsh, prairie, basin, depression, spring/ seep, wet meadow	*Typha latifolia* (cattail) *Cyperus spp.* (flatsedge) *Schoenoplectus spp.* (sedges) *Juncus spp.* (rushs) *Eleocharis spp.* (spikerush)
PSS1 (C, A, B, J)	Palustrine, scrub-shrub, broad-leaved deciduous	Shrub floodplain , bottomland, spring/ seep	*Salix exiqua* (Coyote willow) *Salix irrorata* (Bluestem willow) *Elaeagnus angustifolia* (Russian olive)
PSS2 (A, J)	Palustrine, scrub-shrub, needle-leaved deciduous	Shrub floodplain, bottomland	*Tamarix spp.* (salt cedar)
PFO1 (C, A)	Palustrine, forest, broad-leaved deciduous	Forested floodplain, bottomland	*Populus spp.* (Cottonwoods) *Salix spp.* (willows) *Ulmus crassifolia* (cedar elm) *Celtis spp.* (hackberry/sugarberry)

Description of Other Habitats:
In accordance with, **A System for Mapping Riparian Areas in the Western United States** (FWS 2009), riparian habitats were identified for all major drainages.

Riparian System:



Uplands: N/A

List of wetland plant species with indicator status: Ecosphere Environmental Services and/or the Navajo Nation performed all field work, and may have generated plant species lists.

Regional Specialized Conventions: N/A

Other discussion of mapping issues (image quality, water conditions, etc.): N/A

References:
NAVAJO NATION ENVIRONMENTAL PROTECTION AGENCY, NATIONAL WETLANDS INVENTORY; WETLANDS MAPPING PROJECT: DRAFT. Prepared by; Ecosphere Environmental Services, 2009. 41p.